

L4 ANSWER 40 OF 49 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 11
ACCESSION NUMBER: 1983:608369 CAPLUS
DOCUMENT NUMBER: 99:208369
TITLE: Isolation and characterization of the three fractions (DE-I, DE-II and DE-III) of rat-liver Z-protein and the complete primary structure of DE-II
AUTHOR(S): Takahashi, Kuni; Odani, Shoji; Ono, Teruo
CORPORATE SOURCE: Sch. Med., Niigata Univ., Niigata, 951, Japan
SOURCE: Eur. J. Biochem. (1983), 136(3), 589-601
CODEN: EJBCAI; ISSN: 0014-2956
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Three fractions (DE-I, DE-II, and DE-III) of Z-protein (fatty acid-binding protein) were isolated from rat liver cytosol by DEAE-cellulose chromatog. and characterized. They had the same mol. wt. (14,000) and essentially identical amino acid compns. However, compns. of endogenous fatty acids differed strikingly from one another. Long-chain fatty acids detected in DE-II were palmitic, stearic, oleic, linoleic, and arachidonic acids. In contrast to DE-II, DE-III contained mainly arachidonic acid. Molar ratios of endogenous long-chain fatty acids to both DE-II and DE-III were estd. to be .apprx.1.0. Unlike the latter 2 fractions, DE-I was virtually lipid-free. Analyses of the 3 fractions by polyacrylamide gel electrophoresis, electrofocusing, and DEAE-cellulose chromatog. before and after delipidation suggested that the difference between DE-I and DE-II was in part due to fatty acids bound to DE-II. In contrast, DE-III appeared to be somewhat different from these forms in its protein structure, though tryptic peptide mappings of the 3 fractions did not reveal clear differences among them. Anal. of the primary structure was made on the most abundant fraction, DE-II, to investigate the relation among the 3 fractions and to other proteins. The protein was a single chain consisting of 127 amino acid residues and had a mostly acetylated N-terminus and a free SH group. The complete sequence of Z-protein showed striking homol. to cellular retinoid-binding proteins and peripheral nerve myelin P2 protein, which indicated the presence of a new family of cellular lipid-binding proteins diverged from a common ancestor. A possible intragenic duplication of Z-protein was also suggested.

L4 ANSWER 47 OF 49 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1954:9342 CAPLUS
DOCUMENT NUMBER: 48:9342
ORIGINAL REFERENCE NO.: 48:1705f-h
TITLE: Highly unsaturated fatty acids. I. A survey of possible animal sources
AUTHOR(S): Holman, Ralph T.; Greenberg, Sheldon I.
CORPORATE SOURCE: Univ. of Minnesota, Austin
SOURCE: J. Am. Oil Chemists' Soc. (1953), 30, 600-1
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable
AB The lipides were extd. from various tissues of lambs, hogs, and cattle, and the content of tetraenoic, pentaenoic, and hexaenoic acids were detd. in the lipides. The data in some cases include figures on lipide yield and the per cent of the above acid types in ovaries, testes, uterus, liver, brains, kidney, adrenals, spleen, heart, spinal cord, pancreas, spermatocord, pituitary, yellow bone marrow, blood, thyroid, parathyroid, and thymus. Lipides from reproductive and glandular tissues have the highest contents of polyunsatd. acids. Lamb-testes lipide contg. 15.6% hexaenoic acid was found to be the richest source of this acid. It also contained 10.3% arachidonic acid. The most practical sources for isolation as well as content are beef-testes lipide and hog-brain lipide for hexaenoic acid and hog-liver lipide for arachidonic acid. To obtain the lipides from the original material EtOH extn. was preferred. 14 references.

L4 ANSWER 48 OF 49 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1944:20500 CAPLUS
DOCUMENT NUMBER: 38:20500
ORIGINAL REFERENCE NO.: 38:2930d-f
TITLE: The polyethylenic fat acids from the liver
of Carcharodon carcharias. III. Separation
and constitution of arachidonic acid
C₂₀H₃₂O₂
AUTHOR(S): Baudart, Pierre
SOURCE: Bull. soc. chim. (1942), 9, 919-22
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable
AB cf. C. A. 37, 5371.4. After sepg. the clupanodonic acid, the highly
unsatd., insol., liquid fatty acids from the liver of Carcharodon
carcharias were subjected to a no. of alternate fractional crystns. of
the Na salts in acetone and fractional distns. of the Me esters, to yield Me
arachidonate (I), b₀ 6-0.8 194-6.degree., d₂₀ 0.9168, n₂₀D 1.4875, R. M.
99.7 (calcd. 98.85), sapon. no. 176.2 (theoretical 176.0), iodine index
316 (theoretical 320). Oxidation of I by KMnO₄ in acetone gives acetic,
succinic and adipic acids, while ozonization of the Am ester yields
acetic, succinic and adipic acids along with AcH. From this it is
concluded that arachidonic acid is
6,10,14,18-eicosatetraenoic acid (cf. Toyama and Tsuchiya, C. A. 29,
6209.1, 8378.6).

L5 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2001 ACS
ACCESSION NUMBER: 1992:588082 CAPLUS
DOCUMENT NUMBER: 117:188082
TITLE: Production of 5,8,11-cis-eicosatrienoic acid by a .DELTA.12-desaturase-defective mutant of *Mortierella alpina* 1S-4
AUTHOR(S): Jareonkitmongkol, Saeree; Kawashima, Hiroshi;
Shimizu,
CORPORATE SOURCE: Sakayu; Yamada, Hideaki
Dep. Agric. Chem., Kyoto Univ., Kyoto, 606, Japan
SOURCE: J. Am. Oil Chem. Soc. (1992), 69(9), 939-44
CODEN: JAOCAT; ISSN: 0003-021X
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A mutant defective in .DELTA.12-desaturase of an arachidonic-acid producing fungus, *Mortierella alpina* 1S-4, was shown to be a novel potent producer of Mead acid (5,8,11-cis-eicosatrienoic acid, 20:3.omega.9). The fungus produced several fatty acids of the n-9 family, i.e., 6,9-cis-octadecadienoic acid (18:2.omega.9), 8,11-cis-eicosadienoic acid (20:2.omega.9) and 20:3.omega.9. Significantly high levels of these fatty acids were produced during growth at low temps. (12-20.degree.).
On submerged cultivation at 20.degree. for 10 days in a 5-L fermentor contg. 2% glucose plus 1% yeast ext. (pH 6.0), the prodn. of 20:3.omega.9 reached apprx.0.8 g/L (56 mg/g dry mycelia), accounting for 15% (by wt.) of the total mycelial fatty acids. The other major fatty acids were palmitic acid (6%), stearic acid (11%), oleic acid (45%), 18:2.omega.9 (12%) and 20:2.omega.9 (3%). Studies on the distribution of fatty acids among lipid classes showed that, irresp. of the growth temp. employed (12-28.degree.), apprx.70% (by mol) of 20:3.omega.9 was present in the triglyceride and the remainder in the phospholipid fraction, esp. in phosphatidylcholine (PC). When the fungus was grown at 12.degree., the proportion of 20:3.omega.9 in the PC fraction was apprx.55%.

L5 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2001 ACS
 ACCESSION NUMBER: 1993:211438 CAPLUS
 DOCUMENT NUMBER: 118:211438
 TITLE: Microbial manufacture of .omega.-9 polyunsaturated fatty acid
 INVENTOR(S): Kawashima, Hiroshi; Yamada, Hideaki; Shimizu, Sakayu
 PATENT ASSIGNEE(S): Suntory, Ltd., Japan
 SOURCE: Eur. Pat. Appl., 11 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 535939	A1	19930407	EP 1992-308927	19920930
EP 535939	B1	19970709		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT,				
SE	JP 05091888	A2	JP 1991-251966	19910930
	US 5322780	A	US 1992-953030	19920929
	AT 155172	E	AT 1992-308927	19920930
	ES 2103895	T3	ES 1992-308927	19920930
			JP 1991-251966	19910930

PRIORITY APPLN. INFO.:
 AB .omega.-9 Polyunsatd. fatty acids are manufd. with microorganisms with altered patterns of fatty acid desaturases, e.g., those with normal .DELTA.5 and .DELTA.6 desaturase activity but deficient in .DELTA.12 desaturase activity. A *Mortierella alpina* mutant was incubated for 10 days in medium without or with Me oleate. The yields of 6,9-octadecadienoic acid (I), of 8,11-eicosadienoic acid (II), and of 5,8,11-eicosatrienoic acid (III) were, without Me oleate: I, 0.25; II, 0.04; III, 0.23; and with Me oleate: I, 0.71; II, 0.16; III, 0.70 g/L medium.

L5 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2001 ACS
ACCESSION NUMBER: 1992:444344 CAPLUS

DOCUMENT NUMBER: 117:44344
TITLE: Fatty acid desaturation-defective mutants of an arachidonic-acid-producing fungus, *Mortierella*

TITLE: *alpina* 1S-4
AUTHOR(S): Jareonkitmongkol, Saeree; Shimizu, Sakayu; Yamada, Hideaki

CORPORATE SOURCE: Dep. Agric. Chem., Kyoto Univ., Kyoto, 606, Japan
SOURCE: J. Gen. Microbiol. (1992), 138(5), 997-1002
CODEN: JGMIAN; ISSN: 0022-1287

DOCUMENT TYPE: Journal
LANGUAGE: English

AB Three mutants, which were defective in the desatn. of fatty acids, were isolated from an arachidonic-acid-producing fungus, *M. alpina* 1S-4, after treating wild-type spores with N-methyl-N'-nitro-N-nitrosoguanidine.

They were designated Mut44, Mut48, and Mut49. Mut44 was a mutant with low .DELTA.5-desaturase activity. It accumulated a high level of dibromo-.gamma.-linolenic acid (DGLA) (28.6%, wt./wt.) but a low level of arachidonic acid (Ara) (10.6%), compared with the wild type, which had levels of 6.3 and 47.0%, resp. Mut48 was unable to desaturate oleic acid (18:1) to linoleic acid (18:2), i.e., .DELTA.12-desatn., and therefore a large amt. of 18:1 (49.5%) accumulated and no fatty acid of the .omega.-6 family was detected. In addn., several fatty acids of the .omega.-9 family, such as 5,8,11-cis-eicosatrienoic acid, were found. In Mut49, 18:2 (46%) accumulated markedly, but only small amts. of DGLA and Ara

were detected. Thus, Mut49 was considered to be defective in .DELTA.6-desatn. These mutants showed a somewhat longer lag phase than the wild type on cultivation at both 28 and 12.degree.C.

L5 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2001 ACS
ACCESSION NUMBER: 1998:97899 CAPLUS

DOCUMENT NUMBER: 128:204097
TITLE: Production of C₂₀ polyunsaturated fatty acids by microbial processes

AUTHOR(S): Shimizu, S.

CORPORATE SOURCE: Department of Agricultural Chemistry, Kyoto University, Kyoto, 606, Japan

SOURCE: Oils-Fats-Lipids 1995, Proc. World Congr. Int. Soc. Fat Res., 21st (1996), Meeting Date 1995, Volume 1, 103-109. P.J. Barnes & Associates: Bridgwater, UK.

CODEN: 65QOAT

DOCUMENT TYPE: Conference

LANGUAGE: English

AB *Mortierella* fungi were found to be potent producers for arachidonic acid (AA), dihomo-.gamma.-linolenic acid (DHGA) and 5(Z),8(Z),11(Z),14(Z),17(Z)-eicosapentaenoic acid (EPA). A soil isolate, *Mortierella alphina* 1S-4, produced 4.3 g/L (274 mg/g dry mycelia; 65% of total mycelial fatty acids) of AA upon cultivation in a medium contg. glucose and yeast ext. It also produced EPA when grown at low temp. (.1toreq. 20.degree.C) or when grown in a medium supplemented with .alpha.-linolenic acid, the max. yield of EPA being 1.88 g/L. When grown in the presence of sesame oil, the same fungus accumulated DHGA (2.2 g/L).

This was found to be due to specific inhibition of .DELTA.5 desaturase by sesamin and related lignan compds. present in the oil. Mutants which are considered to be defective (or to have low activity) in .DELTA.5, .DELTA.6, .DELTA.12, .DELTA.9 and .omega.3 desaturase were derived from

M. *alpina* 1S-4. Mutant Mut44 and S14 have low .DELTA.5-desaturase activity, accumulating a high DHGA level. The max. prodn. (3.2 g/L) of DHGA was obtained with Mut44, but the max. content (43.3% of total mycelial fatty acids) of DHGA in the oils was obtained with S14 strain. Mutant Mut48 is completely defective in .DELTA.12 desaturase, producing three n-9 PUFA, i.e., 6(Z),9(Z)-octadecadienoic acid, 8(Z),11(Z)-eicosadienoic acid and 5(Z),8(Z),11(Z)-eicosatrienoic acid (20:3 .omega.9). The prodn. of 20:3 .omega.9 by this mutant was 0.8 g/L (15% of total mycelial fatty acids). Two nonmethylene-interrupted PUFA, 5(Z),11(Z),14(Z)-eicosatrienoic acid and 5(Z),11(Z),14(Z),17(Z)-eicosatetraenoic acid, were found in the .DELTA.6 desaturase-defective mutant. Two other mutants, T4 and K1, were considered to have defects in .DELTA.9 and .omega.3 desaturase, resp. T4 accumulated a high level (38%) of stearic acid, and K1 did not produce

n-3 fatty acids which are usually found on growth of the parental strain at low temp.